



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/843,417 | 04/26/2001 | Tetsuharu Fukushima | 450100-03177 | 9333 |

7590 10/29/2002

William S. Frommer, Esq.
FROMMER LAWRENCE & HAUG LLP
745 Fifth Avenue
New York, NY 10151

EXAMINER

LE, DANG D

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 10/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/843,417

Applicant(s)

FUKUSHIMA, TETSU HARU

Examiner

Dang D Le

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 9/18/02 have been fully considered but they are not persuasive. The applicant's argument is on the ground that "Inariba suggests the poles of the magnets may be offset by an angle equal to the phase difference between AC currents supplied respectively to the coils" and "thus Inariba fails to disclose that the offset is determine based on torque ripples per rotation of the rotor." It is noted that in the art of motor and generator, there is a relationship among the phase difference, torque ripples and smooth operation or noise. In fact, the torque ripple is a function of the phase difference. See Kordik, column 1, lines 55-67.

Therefore, the rejection is still deemed proper and repeated hereinafter.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Inariba.

Regarding claim 1, Shimizu shows an AC servomotor using an annular polar anisotropic magnet (column 5, lines 60-65) in a rotor.

Shimizu does not show the annular polar anisotropic magnet being split into two or more annular polar anisotropic magnets in an axial line direction thereof, and magnetic poles of the corresponding split annular polar anisotropic magnets are disposed so as to be shifted by a predetermined angle θ' which is greater than a skew angle θ which is determined based on the number of torque ripples per rotation of the rotor determined by the number of magnetic poles of the annular polar anisotropic magnet at the rotor side and the number of slots in a stator-side iron core.

For the purpose of obtaining a smooth operation, Inariba shows the annular polar magnet being split into two or more annular polar magnets in an axial line direction thereof (Figures 5A, 5B), and magnetic poles of the corresponding split annular polar anisotropic magnets are disposed so as to be shifted by a predetermined angle β .

Since Shimizu and Inariba are all from the same field of endeavor; the purpose disclosed by one inventor would have been recognized in the pertinent art of the others.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to split the annular polar anisotropic magnet into two or more annular polar anisotropic magnets in an axial line direction thereof, and dispose magnetic poles of the corresponding split annular polar anisotropic magnets so as to be shifted by a predetermined angle θ' which is greater than a skew angle θ which is determined based on the number of torque ripples per rotation of the rotor determined by the number of magnetic poles of the annular polar anisotropic magnet at the rotor side and the number of slots in a stator-side iron core as taught by Inariba for the purpose discussed above.

In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to shift the two or more magnets by an angle greater than the skew angle, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 2, it is also noted that it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the skew angle θ equal to half the period of a cogging torque which is determined based on the number of torque ripples per rotation of the rotor determined by the number of magnetic poles of the annular polar anisotropic magnet and the number of slots in the stator-side iron core, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 3, it is also noted that it would have been obvious to one having ordinary skill in the art at the time the invention was made to obtain the predetermined angle θ' by adding to the skew angle θ a value which takes into consideration magnetic interference between the split annular polar anisotropic magnets., since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 4, it is also noted that it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the predetermined

angle theta prime approximately $\frac{4}{3}$ times the skew angle theta which corresponds to half the period of a cogging torque determined based on the number of torque ripples per rotation of the rotor determined by the number of magnetic poles of the annular polar anisotropic magnet and the number of slots in the stator-side iron core, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Information on How to Contact USPTO

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dang D Le whose telephone number is (703) 305-0156. The examiner can normally be reached on Monday through Friday.

Application/Control Number: 09/843,417
Art Unit: 2834

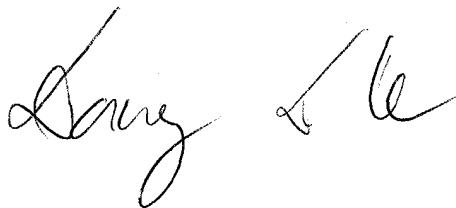
Page 6

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

DDL
October 27, 2002

PC

A handwritten signature in cursive script, appearing to read "Long" followed by a stylized flourish.